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ABSTRACT

This is a preliminary report on the testing of two hypotheses related to the acquisition of Spanish phonemes, namely that in the nasal series, production of the labial is acquired before the dental, followed by the velar; and that the liquid series, containing "l", "r", and trilled "r" (rr) will be the last class of sounds to be acquired. These hypotheses were tested on six Spanish-speaking children. The intervocalic position was chosen as that of maximal contrast. On a weekly basis, over a period of five months, the subjects were asked to imitate nonsense syllables containing the form VCV, allowing for the collection of data on all 18 Spanish consonant phonemes in three environments: a-a, i-e, and u-o. In addition, spontaneous speech and real word imitation was allowed, but not analyzed in this report. The sessions were recorded on tape and phonetically transcribed. Taking instability to indicate recent acquisition, the results neither disprove nor prove the first part of hypothesis 1; seem to support part 2 of hypothesis 1; and seem to support hypothesis 2. The conclusion calls for further study on younger Spanish-speaking children. An appendix lists all stimulus items that were used. (AM)

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NOTE ON THE ACQUISITION OF SONORANTS IN SPANISH

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INTRODUCTION

This note presents a preliminary report on data obtained from six Spanish-speaking children who served as subjects in a study on the production of intervocalic consonants in Spanish.[1] The analysis presented here deals with the testing of two hypotheses.[2] These are:

Hypothesis 1. The production of labial m will be acquired earliest of the three nasals, followed closely be dental n, and then, after some time, by palatal ɲ.

Hypothesis 2. The liquids l, r, ɾ will be the last class of sounds to be acquired.

The decision to investigate intervocalic consonants was due in part to the fact that the intervocalic position is the position of maximal contrast. Of the eighteen consonant phonemes in Spanish, sixteen can appear initially[3], five finally[4], and all eighteen intervocalically. The three nasals /m, n, ɲ/ occur distinctively only between vowels; similarly, the two r phonemes, the apico-alveolar single flap /r/ and apical trill /ɾ/, contrast only in intervocalic position.

SUBJECTS

The subjects for this study were from Redwood City, California, a town with a fairly large Spanish-speaking community[5]. The children were from essentially monolingual (Spanish) families of the lower income bracket. Data referred to in this note are from six of the fifteen children involved in the Redwood City study. These six were selected for this report because there was a good deal of data on them, and they were at revealing stages of phonological development.

Table 1. Sex, age, and number of sessions for each of the six subjects.

Initial	Sex	Age at beginning of study	Number of sessions tested
J	M	2;4	13
R	M	2;7	12
L	F	2;7	16
Ja	M	3;1	7
Ed	M	3;3	13
A	M	3;3	10

COLLECTION AND ANALYSIS OF DATA

Data were obtained by means of an imitation task in which the experimenter, a native speaker of Spanish, asked the child to repeat certain nonsense syllables of the form VCV. In a single session, a subject imitated eighteen VCV's, each with a different consonant. For example, a subject would be asked to repeat apa, umo, ife, ata, uno, ise, etc. In the next session he repeated the same consonants but in different vowel environment, e.g. ama, ufo, ite, ana, uso, ipe, etc. In this way data were collected on all the consonants in three vowel environments: a-a, i-e, u-o. The Appendix contains the complete list of stimulus items that were used. Subjects were "tested" (i.e. asked to repeat the syllables) on a weekly basis over a period of five months. In addition to the data obtained from VCV's, spontaneous speech samples were obtained by asking the subjects to name the object/ animals/ people depicted in selected story books. If a child was unable to identify a picture, the experimenter would name it, e.g. "Es un elefante" (It's an elephant) or "Mira la bandera" (Look at the flag), and then ask the child to repeat the phrase. Thus, each testing session included a sample of spontaneous speech, imitations of real words, and repetitions of the eighteen VCVs. All sessions were recorded on an Uher 4000.

Each of the tapes recorded in Redwood City were transcribed independently by members of the Research Project. Using a Revox tape recorder and earphones, each member transcribed the target consonants in narrow phonetic notation and the environing vowels in a somewhat broader notation. The individual transcriptions were then compared and the transcribers listened as a group to the VCVs to reach agreement on a final transcription. Cases in which no agreement was reached were referred to meetings of the Child Phonetics Workshop[6].

RESULTS

The data and analyses cited below are from the subjects' imitations of the VCV forms. The other items elicited from these children are still undergoing analysis and are not included in this report.

Regarding Hypothesis 1, the data are not sufficient to prove or disprove the first part since all six subjects seemed to have stable renditions of both m and n. There was some evidence supporting the second part of the prediction. Although palatal ɲ appeared in the repertoire of all six children, it varied more than the other nasals in place and manner of articulation. The

commonest type of variation was the production of a velar nasal, ŋ. Four subjects made this error (i.e. R, L, T, J), and in eight cases out of nine, the substitution occurred in the imitation of the VCV ine. One child, Ed., substituted alveolar n for ɲ three out of thirteen times; in three other imitations Ed had no closure on his rendition of ɲ, producing a nasalized vowel followed by a nasalized glide, e.g. [ãj̃a] for [aɲa]. The sixth subject, Ja, produced renditions of ɲ which were consistently close to the adult model.

If we assume that more recently acquired sounds tend to be less stable than earlier acquisitions, then the variations in the production of ɲ would indicate that it was acquired after m and n, thus partially confirming Hypothesis 2. In any case, the apparent instability of ɲ in no way disconfirms the hypothesis. Data recently obtained from younger Spanish-speaking children from Mexico City appear to provide stronger support of the prediction since some of the children seem to have two nasals m and n but not ɲ. As these data have not been fully analyzed, however, no conclusive statements can be made at this time.

Hypothesis 2 predicts the late acquisition of l, r, r̆[7]; it is based primarily on Jakobson's theory of order of acquisition in phonological development. According to his theory, "oppositions which occur in the languages of the world comparatively rarely are among the latest phonological acquisitions of the child" (Jakobson 1968). Given that a large number of languages have only a single liquid (either l or r), it is not unusual, he claims, for a child to have a single liquid for a long time, acquiring the other liquid as one of his last speech sounds. For our purposes, and presumably in accord with Jakobson's usage, a class of sound is said to be acquired by a child when he demonstrates the ability to produce renditions of the phonemes in that class which are consistently distinct from one another and are within an acceptable range of the adult model. Hypothesis 2, then, states that the three liquids in Spanish will be the last to appear as distinct consonants in the child's repertoire.

This prediction seems to be borne out by the data. Of the six subjects under discussion, only one, Ja., has three different liquids. His production of l differs from that of the two r's and they, in turn, are distinct from one another although neither is stable phonetically. In adult Spanish, /r/ is a voiced apico-alveolar single flap while /r̆/ is a voiced apical trill. According to some phonetic analyses (Chomsky/Halle 1968, Harris 1969) the only distinction between the two r's is subglottal pressure;

the trill is said to be produced with heightened sub-glottal pressure, while the flap is produced with less sub-glottal pressure. Ja's renditions of /r/ and /ř/ differ along other parameters; these are manner (/ř/ is characterised by the presence of friction[8]) and rate (the speed of articulation is faster for /r/ than for /ř/ although the articulatory movement is sometimes similar). In addition to the three liquids, Ja has acquired all the other consonant phonemes although many of them are still phonetically unstable. Thus, his case neither supports nor contradicts the hypothesis.

Of the remaining five subjects, none appears to have all three liquids in his phonemic repertoire. Two of them, L and Ed, produce an l which is distinct from r and ř, but the two r's are not distinct from each other. For both children r/ř is generally [+coronal] and about 50% of the productions are characterized by some sort of "r-quality", i.e., r-coloring on surrounding vowels, or retroflexion on the target consonant. Ed seems to have acquired the sounds in other classes; L has all other sounds except f for which she consistently substitutes a p which seems to be indistinguishable from her rendition of the voiceless stop /p/.

J and R are at an early stage in the acquisition of liquids; both of them produce renditions of l, r, ř which are indistinguishable from one another. J typically produces a continuant l for all three liquids while R produces an affricate l : [ɟ] or [ʤ]. Both J and R have acquired the other consonants of Spanish with the exception of /ð/, renditions of which are similar to, sometimes identical with, /l - r - ř/.

A is unique among the six subjects in that his renditions of the l, r, ř showed some development during the course of the study. In the first sessions, all three liquids were produced as some kind of lateral and were not distinct from one another. In later sessions, however, his rendition of lateral l was clearly different from r and ř which were both alveolar stops, non-lateral, non-retroflexed, often having friction on the release. A seems to have acquired all the other phonemes except s for which he consistently produced t.

CONCLUSIONS

Hypothesis 1 predicting the order of acquisition of nasals is neither proven nor disproven by the data from the six subjects. If variation in the production of /n/ is interpreted as an indication of recent acquisition, then there is some evidence supporting the hypothesis. In any case, there seems to be no evidence contradicting it. Newly acquired data from younger Spanish-speaking children should provide stronger evidence for confirmation or rejection of the prediction.

Hypothesis 2 seems to be supported by the data. Five of the six subjects had not acquired the liquid class but appear to have acquired most of the sounds in the other classes. The one child who had three liquids in his phonological system also had all the other sounds of Spanish.

FOOTNOTES

1. This study is part of a larger one on phonological development entitled: Aspects of the Acquisition of English and Spanish Phonology, NSF Grant GS 30962.

2. These two hypotheses are Hypothesis 5 and Hypothesis 6 respectively from the Research Proposal, p 41 and p 43.

3. All except /r/ and /ɲ/.

4. These are /r, s, n, l, d/.

5. For a sociolinguistic description of Redwood City, see Cohen, in press.

6. A workshop on child phonetics was held in conjunction with ongoing research on phonological development in English and Spanish; see Johnson and Bush, (1971).

7. In the dialect of Spanish being studied, /l/ is the only lateral since the palatal lateral ll| ʎ |has merged with the palatal glide /j/, cf. Canfield, (1962).

8. This is not surprising since friction often occurs on trilled r in adult Spanish, especially in rapid or colloquial speech; del Rosario (1970) states that an assibilated fricative r occurs frequently in the "habla popular" of Mexico, Ecuador, Peru, Bolivia, Paraguay, Argentina, and Uruguay.

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APPENDIX

VCV items elicited from subjects

Session I	Session II	Session III
apa	ala	aña
ulo	uño	ugo
iñe	igue	iwe
aga	awa	acha
uwo	ucho	udo
iche	ide	ille
ada	alla	asa
ullo	uso	uto
ise	ite	irre
ata	arra	afa
urro	ufo	ubo
ife	ibe	ire
aba	ara	ana
uro	uno	uko
ine	ike	ije
aka	aja	ama
ujo	umo	upo
ime	ipe	ile